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MAY 31, 1952

SCIENCE NEWS LETTER

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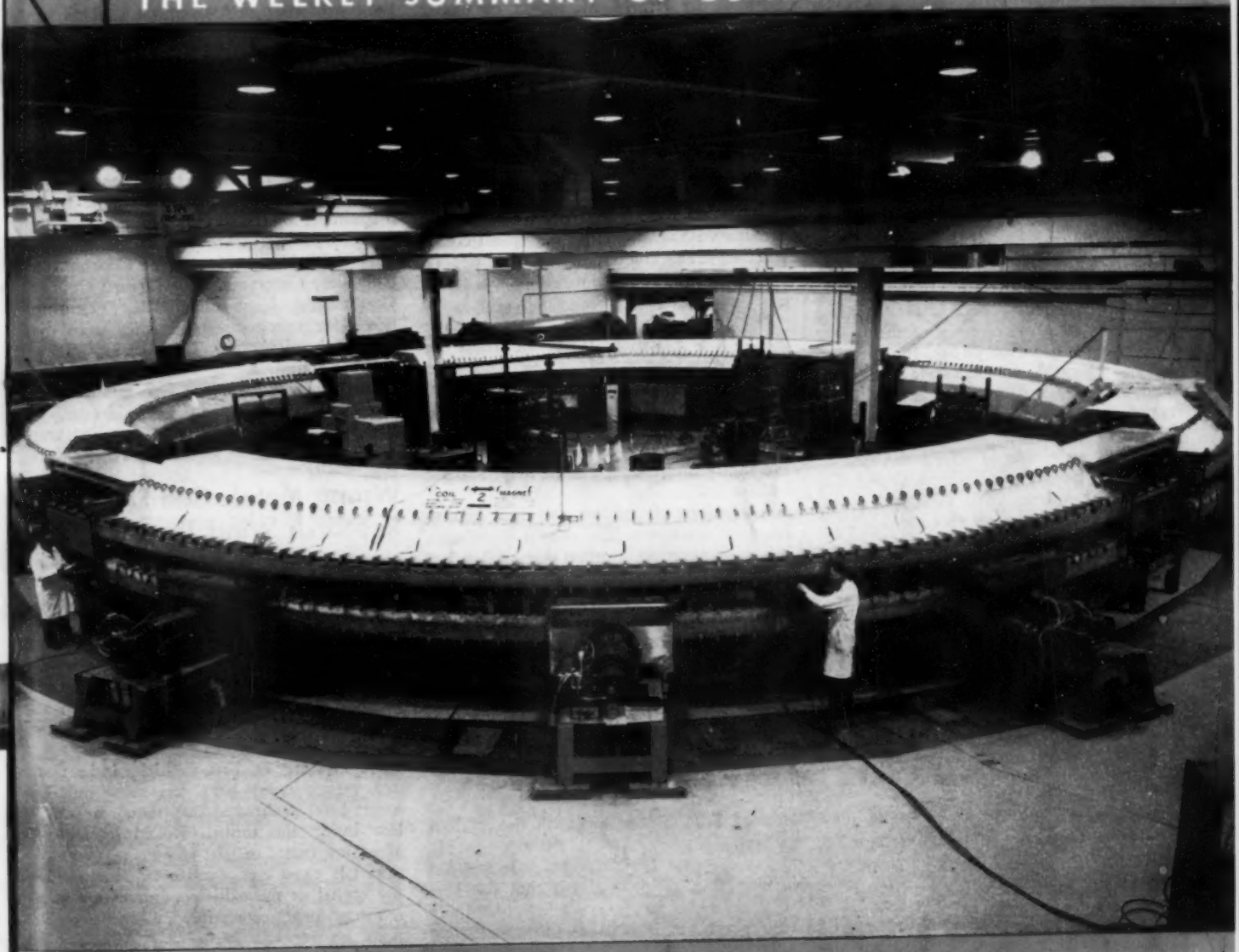
THE WEEKLY SUMMARY OF CURRENT SCIENCE



First Billion-Plus Volt Accelerator

See Page 341

A SCIENCE SERVICE PUBLICATION

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VOL. 61 NO. 22 PAGES 337-352

MEDICINE

Heal Cut Spinal Cord

Paralysis from injured or cut spinal cords may be overcome by treatment with the drug, Pyromen, experiments with two patients show. Early attention needed.

➤ A NEW treatment that may overcome or prevent paralysis from damaged or cut spinal cords was reported to scientists at the National Institutes of Neurological Diseases and Blindness in Washington.

The first human "guinea pig" for the treatment is 21-year-old Charles Van Diviere of Brunswick, Ga., who two years ago was believed dying after an accident in which the spinal cord in his neck was crushed if not actually broken. Both arms and both legs were paralyzed and he had no control of body functions.

Now, after two years of the new treatment, he is able to go about without crutches and wears a short brace only part of the time. He is back in college, about to graduate, goes to dances, swims, climbs stairs and does everything a normal college man does except take part in sports.

He and his grateful family credit the new treatment with his recovery. Dr. William F. Windle, scientific director of the Baxter Laboratories at Morton Grove, Ill., the man largely responsible for developing the treatment, is more conservative. He thinks the treatment with the drug, Pyromen, saved the young man's life, but points out that the family was able to afford the best of care for the boy in every other way and that occasionally patients with this kind of injury recover without any sort of treatment.

More exciting to Dr. Windle is a patient now at the Veterans Administration Hospital in Richmond, Va. This patient is the only one, so far as Dr. Windle knows, who has responded to the drug and who is known positively to have had his spinal cord cut across. In other patients there is some doubt as to whether the spinal cord was cut or compressed without actually being cut.

The drug, Pyromen, is a polysaccharide derived from a microorganism of the Pseudomonas species. It was developed, as a medicine valuable for its fever-producing qualities, by Dr. N. M. Nesset of Baxter Laboratories. About two years ago it was found that very small doses, less than those that produce fever, would prevent the growth of scar tissue at the cut ends of spinal cords in dogs and cats. Nerve fibers grew across the cut ends and nerve function was restored.

This reversed previous scientific opinion that cut spinal cords could not be regenerated. The formerly hopeless outlook for patients with damaged or cut spinal cords, whether from civilian or war injuries or disease such as infantile paralysis, was somewhat changed.

Dr. Windle thinks now that to do any good, the Pyromen treatment must be started very soon, within a few days, after the injury or damage, unless an operation is done to remove the scars that have formed at the injured place. Whether with such an operation the paralyzed victims of long-ago injury and disease can be helped is not known yet.

A number of patients are now getting Pyromen treatment. The one in Richmond, in whom a cut rather than damaged spinal cord was proved, has gotten back some voluntary movement. It is not yet enough to do him any good, but it does bear out the results in cats and dogs and adds fresh hope that the treatment may prove successful.

Science News Letter, May 31, 1952

PALEONTOLOGY

Ape-Gibbon "Missing Link"

➤ A HALF-APE stage in evolution may have come before the development of the gibbon, just as an ape-man may have preceded man.

Evidence of such a "missing link" has been found in a limestone deposit in Czechoslovakia and is reported in a communication just received at the U. S. National Museum from Dr. H. Zapfe, Vienna paleontologist.

The bones were those of five individuals of a Middle Miocene species called pliopithecus. Previously, these creatures had been known only from remains of skull bones and teeth and these, especially the teeth, showed close relationship with the modern gibbon.

But the new find includes arm and leg bones. Study of these shows that the legs of pliopithecus were very much like those of the gibbon. The arms, however, were very different.

Striking thing about the modern gibbon is the extreme length of its arms and their form which is well adapted to its habit of swinging about from branch to branch in the tree-tops. The arms of pliopithecus, it is now found, were very different from those of the gibbon. Their length in proportion to the trunk is more like those of the chimpanzee and man. The form of the bones, especially that of the humerus and ulna, has a primitive look.

The find, Dr. Zapfe reports, is a "brilliant confirmation" of the suspicion of paleontologists that the gibbon did not develop his tree-swinging way of life until relatively recently, that is to say not more than about ten million years ago.

Science News Letter, May 31, 1952

ASTRONOMY

Faint Comet Discovered; Visible in U. S. Night Sky

➤ A NEW comet has been discovered in the constellation of Andromeda, visible from the United States in the early morning hours. When found it was of the tenth magnitude, thus far too faint to be seen with the naked eye or binoculars.

The comet will be called Comet Mrkos after its discoverer, Antonin Mrkos of the Astrophysical Observatory at Skalnate Pleso, Czechoslovakia. This is the second comet to his credit; the other, also of the tenth magnitude, was spotted in January in 1948.

Word of the discovery was cabled by Miss J. M. Vinter Hansen of Copenhagen University Observatory to Harvard College Observatory, Cambridge, Mass., clearing house for astronomical information in the western hemisphere.

When found on May 14, the comet's right ascension was 23 hours, 57.7 minutes; its declination plus 40 degrees, 42 minutes.

Science News Letter, May 31, 1952

ENGINEERING

Wrong Metals Can Spoil Research Wind Tunnels

➤ CAREFUL ATTENTION must be given to metal out of which low-pressure wind tunnels are to be built for studying flight characteristics of jet planes and guided missiles from 40 to 60 miles high.

George J. Maslach, supervising engineer of the Institute of Engineering Research at the University of California, reported to the American Institute of Chemical Engineers meeting in French Lick, Ind., that cast metals often have too many microscopic holes in them to keep the air pressure low inside the tunnel. Rolled or forged alloys are better in that respect.

Metals must not oxidize or rust inside the tunnel or the oxide coating will absorb moisture and create unfavorable test conditions, he warned.

After the tunnel is completed, the metal must be cleaned thoroughly and covered with low vapor pressure paints and varnishes.

Creating the vacuum to simulate stratospheric air pressures largely can be done by modern commercial air pumps capable of high-capacity, low-density air flow.

Science News Letter, May 31, 1952

METEOROLOGY

Foretell Seasonal Weather

More accurate long-range weather predictions expected to come from more knowledge of sun's effect on earth's surface, although "how" theories vary.

➤ OUT OF the sun will come knowledge which will make possible more detailed and more accurate long-range predictions of the weather. The next step forward is predicting the weather of an entire season.

But the kind of knowledge of the sun's behavior which is required for these better forecasts, and for better understanding of the fundamental facts of atmospheric circulation, is the subject of controversy among meteorologists and physicists.

Jerome Namias, chief of the Weather Bureau's Extended Forecast Section, says that the primary factors operating to bring about the large-scale, long-period weather regimes are, first, the changes in the amount of radiation received from the sun by the northern hemisphere because of the ever-changing position of the earth with respect to the sun during the year, and, second, the state of the earth and its atmosphere, upon which those changes in radiation work.

These changes operate differently according to whether the sun's rays fall on the ocean, or on bare or snow-covered ground, or whether or not there are clouds in the sky. The receptive factors of the earth's varying surface and its varying cloud cover are themselves different from month to month and from year to year, Mr. Namias points out.

The changes in heating produced by these factors, Mr. Namias goes on, will produce continually different weather patterns when looked at on a nation-wide or hemisphere-wide scale.

Dr. H. C. Willett, professor of meteorology at the Massachusetts Institute of Technology and a former teacher of Mr. Namias, has evolved the theory that solar eruptions and sun spots, irregularly changing the character of the sun's radiation and acting upon the earth's ozonosphere, are connected with large-scale, long-period weather regimes. He says that it will some day be possible to predict such regimes from the sun's activity.

Dr. Willett is now willing to make general weather predictions for as much as a season in advance. At present, however, his predictions are based on a number of considerations, of which irregular solar activity, used statistically, is only one. We still do not have the exact physical knowledge either of what comes to us from the sun, or its direct effects in the higher atmosphere, which is needed to utilize effectively the solar factor in seasonal predictions, according to Dr. Willett. Utilizing this "number of considerations," Dr. Willett made a prediction for last winter which did not turn out so well.

Mr. Namias still confines his predicting to no more than a month in advance, but he believes that his system, which he calls "moderately successful" over the past two and a half years it has been used on a public basis, might be applied to seasonal forecasts. However, much work remains to be done on the methods of applying the theory.

Dr. Willett says that the ultimate possibilities of his solar method are probably farther from practical realization as a seasonal forecasting tool at the present time than is Mr. Namias' method.

As Mr. Namias points out: "Since the ultimate test of a theory lies in its ability to predict, this difference of views may well be resolved during the current generation."

Science News Letter, May 31, 1952

SURGERY

Tonsil Bleeding Less With Regular Operation

➤ BLEEDING AFTER tonsil operations can be prevented if surgeons perform a regular operation instead of snatching the tonsils by snare or guillotine methods, Dr. Ernest B. Emerson, Jr., of the University of Rochester, N. Y., School of Medicine and Dentistry declares in a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (May 24).

By a regular operation he means carefully dissecting the tonsil and sewing up the fossa, or pit in the throat, it was taken from.

In 634 patients operated on this way, from children under three to grown-ups of 50 and over, bleeding occurred in only two. One was in a 65-year-old man who jammed his lower dental plate into the wound and tore out the stitches. The other was in a seven-year-old girl who slipped away from her mother to go swimming the third day after the operation. In diving off the high diving tower she landed with her mouth open and tore out the stitches on one side.

Less nausea, because there is no oozed blood to swallow, and greater ease in swallowing, because there is a much smaller wound left open, are other advantages Dr. Emerson finds for the method.

Science News Letter, May 31, 1952

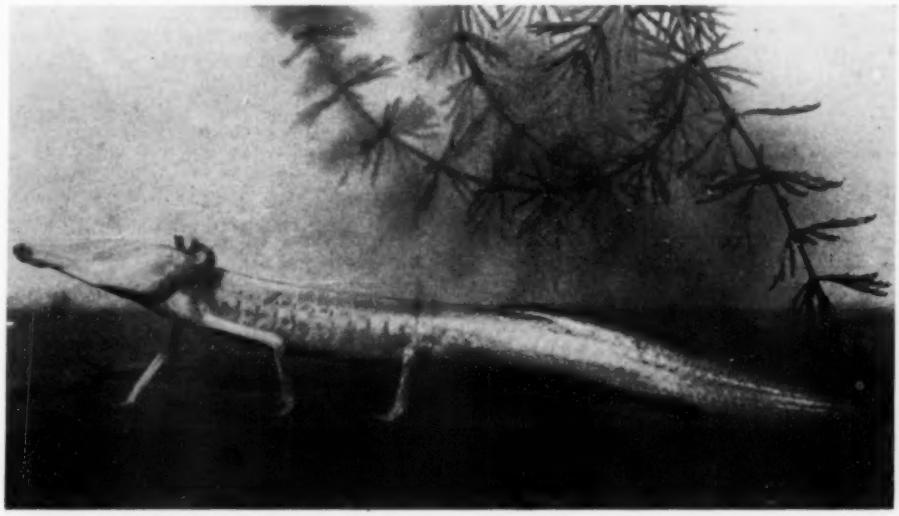
TECHNOLOGY

Blow Over Snow At 45 Miles Per Hour

➤ THE BLOWMOBILE is the Seabees' answer to slippery snow-covered ground that makes walking difficult around Point Barrow, Alaska.

Dubbed "It Won't Work," the blowmobile nevertheless does work and will speed across glistening snow at 45 miles an hour, blown along on its skis by an airplane propeller driven by a 95-horsepower Mercury engine.

Science News Letter, May 31, 1952



BLIND CAVE SALAMANDER—With only tiny, vestigial spots, the cave salamander has no eyes at all and its body is almost without pigment, as this photograph taken with special equipment shows. Measuring four inches in length, it is characterized by a shovel-like snout and external gills.

AERONAUTICS

Aid Aircraft Control

Air Navigation Development Board reports ground-based radar most responsible for traffic control improvement. Terminal control distances need to be greater.

➤ PROVISION OF ground-based radar at American airports has made possible the greatest single improvement in airplane traffic control in the last decade, the recent report of the Air Navigation Development Board states.

Plane landings three minutes apart are now routine at airports having radar and trained radar controllers.

The recent improvements in traffic control efficiency have come about through the ability of radar to provide controllers with instantaneous, accurate and unambiguous position data, the report states. But even better traffic control is predicted for the near future with airborne radar relays.

Transponder beacons such radar relays are called. They pick up and re-emit radar signals. This airborne equipment will provide longer distance radar coverage, freedom from ground echoes and simple aircraft identification.

"In our opinion," the report states, "ground surveillance radar supplemented by airborne transponders, used in conjunction with VOR (Very High Frequency Omnirange) and DME (Distance Measuring Equipment), and operated under proper rules and procedures of the sort now being developed by simulation and operational tests, will be completely sufficient to handle traffic of mixed aircraft types at a rate of 30 operations per hour on a single runway, and single-type aircraft traffic at a rate of 45 per hour."

With the coming of faster planes, equipped with turbo-prop or turbo-jet propulsion, terminal control will be forced to extend for greater distances from airports. Terminal control will extend out into areas now recognized as en route control areas. Obviously the two types of control must operate with a great deal of cooperation, if not actually merge into a single system.

It is our conviction, the report declares, that the merger will occur in the denser continental regions and that the only difference between en route and terminal control will be one of degree. The necessity for precision is somewhat less for an en route aircraft than for those nearing approach.

Science News Letter, May 31, 1952

MEDICINE

Double Nerve Operation Helps Stomach Ulcers

➤ A DOUBLE nerve operation that helps stomach ulcer patients was reported by Dr. Ulysses Grant Dailey of Chicago at the meeting of the International College of Surgeons in Madrid, Spain.

In this operation the vagus nerve is cut through an opening in the diaphragm and the phrenic nerve is crushed through an opening in the neck. Two doctors operate simultaneously, one on each nerve.

Patients are out of bed the day after operation and back to work within three to five weeks, Dr. Dailey reported.

Cutting the vagus nerve to slow down stomach overactivity and thus give the ulcer a chance to heal has been done for half a dozen years. The crushing of the phrenic nerve causes a one-sided paralysis of the diaphragm between the chest and abdomen. The diaphragm is then pushed up by the abdominal organs including the stomach which takes a vertical position favoring drainage. The paralysis of the diaphragm lasts only three to six months but this is enough to help in healing the ulcer.

The double operation, Dr. Dailey said, is "a boon to poor risk patients" in whom removal of a large part of the stomach, performed in some ulcer cases, would be dangerous.

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Question Box

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How does low pressure prevent corrosion from chemicals? p. 345.

ELECTRONICS
What part of America's population will be within TV reach in July? p. 351.

MARINE BIOLOGY
If the beach seems to rise up and move, what could be blamed? p. 343.

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How can you find out who "wears the pants" in your family? p. 342.

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Photographs: Cover and p. 341, Brookhaven National Laboratory; p. 339, Dr. Edward S. Ross; p. 342, National Bureau of Standards; p. 343, Fremont Davis; p. 349, U. S. Air Force.

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GEODESY

Twinkling Lights Help Geodesists Map Antilles

➤ IN FIVE weeks the Inter-American Geodetic Survey spotted Cuba, Haiti and Jamaica on the map more accurately than ever before by searching for twinkling spotlights at night. Survey officials estimated it would take six months. Skeptics said it could not be done at all.

The islands were put into their accurate places on maps by first-order triangulation, a surveying-mathematical process accurate to about one foot in 25 miles. At night powerful 500-watt, ship-type searchlights winked at each other from island mountain-tops. Instrument crews on the three islands each took 32 readings on all visible stations to average out errors.

At that time the record distance for line-of-sight triangulation stood at 190 miles. But Inter-American geodesists pushed the figure to 214.5 miles.

The "shot" was made between station Pico Turquino in southeastern Cuba to station Macaya on the western tip of Haiti. Special 1,000-watt aircraft beacons, equipped with redesigned mountings and reflectors, were required to bridge the night.

The object of the Antilles Tie, as it was called, was to find the exact location of the three islands with respect to themselves and to established triangulation networks that had been extended into Cuba.

The project was part of a gigantic charting program that ultimately may lead to photo-mapping of nearly every square inch of land in the western hemisphere.

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ENGINEERING

Lighter New Bridges Assembled More Quickly

➤ COMBAT SOLDIERS soon will assemble aluminum and steel into a new series of floating and fixed military bridges that may replace such old stand-bys as the Bailey bridge of World War II fame.

The new series, just announced by the Defense Department, is designed to permit the heaviest field or division army equipment to cross swift-moving water. Soldiers carrying field equipment can dash across the bridges at double-time.

The floating structures are buoyed by heavy-duty pontoons that hold up well under strafing and that do not depend upon minimum water depths.

Much more stable in high currents than present-day types, the bridges can be hand-assembled quickly under combat conditions because of the simplicity of design, the Army reported. The series was developed by the Army Corps of Engineers and can handle either single or two-lane traffic.

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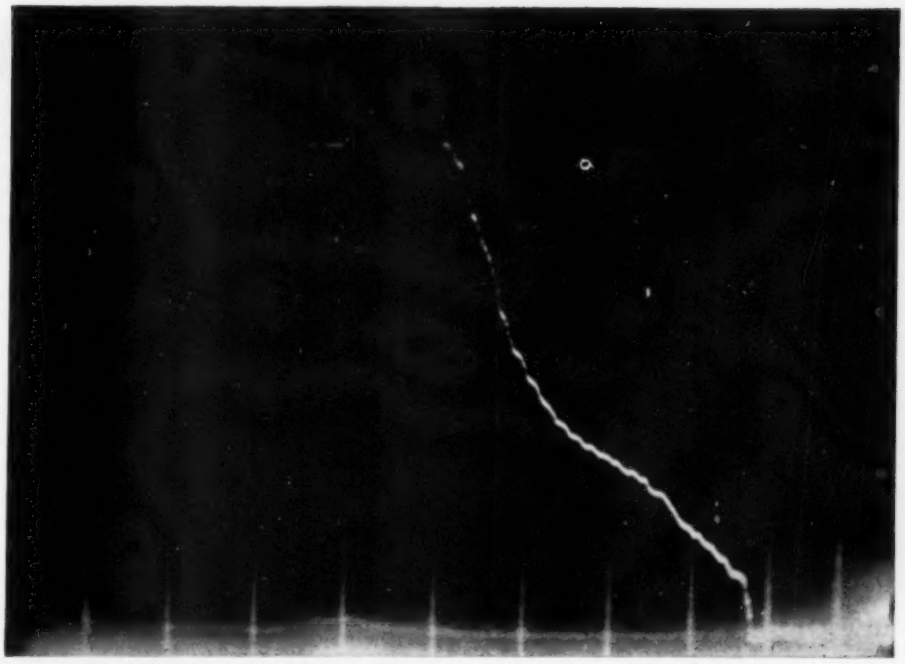

BEAM INTENSITY RECORDED—A photograph of the screen of an oscilloscope showing the 1.3 billion volts to which atomic particles, protons, were accelerated by the Brookhaven cosmotron. Trace indicates the beam intensity as it is being accelerated in the magnet gap, the lateral extent showing the length of time the beam travelled around the magnet.

PHYSICS

Cosmotron Fires 1.35 Bev

Brookhaven's particle accelerator speeds up protons to energy of 1.35 billion electronvolts. Instrument designed to achieve 2 Bev, heretofore available only in cosmic rays.

See Front Cover

➤ THE GIGANTIC "atom-smasher" at Brookhaven National Laboratory, Upton, N. Y., has achieved 1.35 billion electron volts on the way to its designed energy of more than 2 billion.

The cosmotron atomic accelerator reached this level on May 20 during its preliminary operating tests. The purpose of this accelerator is to speed up protons, hearts of hydrogen atoms, until they acquire an energy in excess of 2 billion electron volts (Bev), an energy available heretofore only in cosmic rays.

The protons can be directed against various targets, such as blocks of copper or graphite, and the results of these collisions studied; or, they can produce other nuclear projectiles, such as neutrons or gamma rays. The cosmotron, shown on the cover of this week's SCIENCE NEWS LETTER, will produce particles of energies over five times that of existing accelerators. Experiments using such particles may produce new information about the forces between nuclear particles.

Once every 5 seconds, a pulse of protons is injected into the cosmotron from a 3½ million volt electrostatic accelerator. A doughnut-shaped magnet with an outside diameter of 75 feet then forces the protons to travel in almost circular paths within the magnet gap, an exterior notch 36 in. wide and 9½ in. high.

Each time these protons make one revolution around the magnet, they are given a small increase in energy, about 1000 volts, by a radio frequency transformer. The magnetic field increases continually so that, as the protons gain energy, they are still kept on approximately the same circular paths.

After some 3 million revolutions and after a travel distance equivalent to five times around the world, half the distance from the earth to the moon, the particles have acquired full energy. The process takes about one second.

The magnet itself is composed of 288 flat steel blocks, 8 feet high and 8 feet wide. Each block weighs 5¾ tons and consists of 12 half-inch laminations insulated from each other. The magnet is energized by a total of about 70 tons of copper bus bar carrying a peak current of 7000 amperes. The

copper bars are hollow so that cooling water can prevent overheating.

Electrical energy for the magnet comes from a 21,000 KVA motor-generator-flywheel unit. A set of 24 large electronic tubes, called ignitrons, serve both as rectifiers, so that direct current is supplied to the magnet, and as inverters so that the major part of the magnetic energy can be returned to the flywheel for storage for the next operation.

Since the presence of air causes the protons to lose energy, they must travel in an evacuated stainless steel box, the vacuum chamber, which rests in the maget gap. Four large mechanical vacuum pumps located in the center of the ring remove most of the air, but twelve 20-inch diffusion pumps situated outside the ring are needed for final evacuation.

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PUBLIC HEALTH

Vaporized Insecticides Are Doubly Dangerous

➤ A WARNING against improper and excessive use of electric vaporizing devices for insecticides has been issued by the American Medical Association in Chicago.

The devices use DDT or lindane or a mixture of two to kill flies and other flying pests.

The insecticides are placed in a cup and slowly evaporated by a built-in heating element or some other heat source such as an electric light bulb. The insecticide is discharged as a vapor or fumes that ultimately settle in the form of crystals on ceilings, walls and other exposed surfaces. These may later fall on floors or tables, and into food and water.

The dangers from improper use of such devices are that the concentration of the vapor in the air may become too high and the material may get into foods or drinking water in dangerous amounts.

Science News Letter, May 31, 1952

AERONAUTICS

Navy Wind Tunnel Draws Last Breath

➤ IT HAS drawn its last breath and it is being decommissioned to the historic heaven to which all good Navy "ships" go. The first of the Navy's wind tunnels, which in 1914 was the world's largest, is becoming a mere memory. From its 8-x-8-foot throat, came design data for such famous airplanes as NC,s, 1, 2, 3 and 4. NC-4, as oldtimers remember, was the first transatlantic airplane back in 1919.

Located at the U. S. Naval Gun Factory in Washington, the wind tunnel is making way for more modern, more secret structures that help design the new Navy.

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PSYCHOLOGY

Find Who "Wears Pants"

Questions to children about who makes what decisions around the home give numerical score showing how well husbands and wives get along.

➤ IN YOUR family, who decides whose job it is to do the dishes? Who decides when the lawn is to be mowed, whose job it is to put out the milk bottles, where to go for the holidays? Who decides what groceries to buy? Is there disagreement?

Based on these and other similar questions, P. G. Herbst, psychologist of the University of Melbourne, Australia, has developed a scale which will give a numerical score on how well wives and husbands get along. Originally developed for use in the UNESCO study of Australian cultures, the scale is suitable, with minor changes, for use in most western urban communities. It was decided that interviewing either husband or wife might result in biased answers and so the questions were put to the children.

Most common pattern of family life in Melbourne is that in which both husband and wife are their own bosses, but where one dominates the other, it is usually the wife who "wears the pants" of the family.

NEW STANDARDS HEAD—Dr. Allen V. Astin, acting director of the National Bureau of Standards since last September, has been nominated by President Truman as the new director. During the war, Astin helped to develop the proximity fuses, which have been rated second only to the atomic bomb in winning the war.

Friction is greatest where either husband or wife tries to boss the other. It is least where both decide together and work together on family affairs.

Family activities, it was found, can be grouped into areas according to the activity of different family members and leadership of husband or wife.

In social activities such as inviting visitors to the home, all members of the family may take part. Earning the money and deciding how to spend it is generally the husband's responsibility. In fact, in Melbourne, if he gives up this area he generally stops living with his wife.

Household duties divide themselves into man's work, woman's work and common tasks. It is the man who mows the lawn and it is he who decides about it, too. But the wife is the one who does the ironing. Either may take a hand at the dishes.

Both parents look after the children, but decisions about them rest with the wife.

By the time they are four years old children take part in the social activities of the family, but even at that early age, boys have learned to let the woman's work alone and girls do not interefere with the man's work.

Details of the study are published by Tavistock Institute of Human Relations, London, and the Research Center for Group Dynamics, Ann Arbor, Mich.

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TECHNOLOGY

Latest Army Wrinkle: Adjustable Locomotive

➤ THE LATEST army wrinkle is an adjustable diesel locomotive.

It can run on tracks varying from the United States standard up to the widest gages in use. A simple mechanical adjustment of the wheels on their axles does the trick.

Locomotive statistics include a 16-cylinder, two-cycle diesel engine rated at 1600 horsepower; a top speed of 77 miles an hour; satisfactory performance in temperatures from minus 40 degrees Fahrenheit to 125 degrees, and consumption of 40-cetane fuel oil or lower.

Known as the MRS-1, the adjustable locomotive was built to the U. S. Army Transportation Corps specifications by General Motors. Thirteen of the units are scheduled for delivery.

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MORE SENSITIVE BALANCE—Miss Bunny Geisbert of the National Institutes of Health staff here shows how the newly developed balance, 10 times as sensitive as conventional projection balance, is operated.

TECHNOLOGY

Sensitive Balance Shown

➤ A NEW balance 10 times as sensitive as conventional projection balances made its debut at the second annual Research Equipment Exhibit at the National Institutes of Health in Bethesda, Md.

The balance is for fast, accurate weighing of small quantities, up to about 7 ounces (200 grams). Weighings to one-tenth of a milligram can be made within seconds by straight projection, or to one-hundredth of a milligram by sensitivity shift and an additional set of 10 weights. It is manufactured by Voland and Sons, Inc., of New Rochelle, N. Y.

A slicing machine with a glass knife that cuts slices too thin to be seen with the naked eye was shown by the International Equipment Co. of Boston. Known as the Minot Rotary Microtome, this slicer cuts much-thinner-than paper sections of nerve and other tissue for examination with the electron microscope. The actual thinness of the pieces is in the order of one-twentieth to one-fortieth of a micron, microns being so small that it takes more than 25,000 of them to make one inch.

For measuring the amount of carbon dioxide, oxygen, nitrogen or carbon monoxide in a pin prick amount of blood, when the test needs to be made on a new baby or a small laboratory animal, there is a new gas analysis apparatus called the Kopp-Natelson Microgasometer available through E. Machlett and Son of New York.

The acidity or alkalinity of soils, water, and foods during the canning process can be measured easily, accurately and on the spot by relatively unskilled personnel with a new machine, called the Compax pH Meter, made by Coleman Instruments, Inc., of Maywood, Ill. The electrode system for this folds into a five-pound case, so that when the cover is closed the system is off. A mercury cell battery like that in modern hearing aids is part of the equipment that gives service for more than a year without going dead.

Science News Letter, May 31, 1952

MEDICINE

TB Patients Helped by Streptomycin and Drainage

➤ PATIENTS WITH tuberculosis of the bones and joints are being helped by a combination of streptomycin treatment and surgical drainage, Drs. M. S. DeRoy and Harry Fisher of Pittsburgh, Pa., reported to the International College of Surgeons in Madrid, Spain.

Fewer children will grow up crippled by painful, deformed joints as a result of this treatment, they said.

Science News Letter, May 31, 1952

MARINE BIOLOGY

If Beach Rises, Suspect Mole Crabs on Mass Move

➤ IF WHEN swimming at the ocean this summer, a portion of the beach seems to rise up, move a bit, then settle down again, you are probably watching mole crabs out after their food.

These curious animals bury themselves in the wet sand of sloping ocean beaches that is covered by the wash of waves. Then they extend their long antennae to collect food, microscopic sea life, from the water flowing past them.

The mole crabs move up or down the beach according to the tide, R. E. Snodgrass of the Smithsonian Institution reported, since as they are exposed by the receding waves, they quickly back themselves into the wet sand in a slanting position. A general migration of the less than inch-sized animals as they search for food is what makes the beach appear to move a few feet.

Science News Letter, May 31, 1952

BIOPHYSICS

Wasted Atomic Energy Product to Treat Cancer

➤ A WASTE product of atomic energy reactors is going to be put to work helping cancer patients.

The waste product is a soft, silvery metal called cesium. More than six percent of the atoms produced when uranium-235 is split is cesium. And this waste product, in its radioactive form, gives off cancer-killing energy equivalent to the million volt X-ray machines.

Only a few of the nation's largest hospitals have these big, supervoltage X-ray machines. A cesium treatment unit can put supervoltage treatment in the hands of every qualified radiologist in the country, in the opinion of Dr. Marshall Brucer, chairman of the medical division of the Oak Ridge Institute of Nuclear Studies.

At a conference of scientists from southern medical schools Dr. Brucer listed the following advantages of a cesium treatment unit for cancer:

1. A unit will be good for 30 years without any maintenance cost.

2. When development costs are amortized, cesium units will be available at a fraction of the cost of present supervoltage units.

3. The single-energy radiation beam of about 600,000 volts will deliver a strong dose to the tumor with a minimum of dosage to intervening tissue, particularly when used in multi-port or rotating beam therapy.

4. Adequate radioactive cesium is now available for making large numbers of units as soon as separation processes are worked out (these processes are now on a pilot plant scale).

Science News Letter, May 31, 1952

PSYCHIATRY

Children Need Affection, Acceptance and Approval

➤ CHILDREN NEED the three A's even when they are not bright enough or healthy enough to learn the three R's, Dr. Leo Kanner, director of the children's psychiatric service, Johns Hopkins Hospital, Baltimore, declared at a conference on exceptional children held at the Woods Schools, Langhorne, Pa.

The three A's are affection, acceptance and approval. They are, Dr. Kanner said, "among the principal cornerstones of wholesome development of mental health among the rich and the poor, the ailing and the sturdy, the average and the exceptional."

Too often, he charged, parents, teachers, psychologists and doctors fail to think of how the exceptional child feels about himself and the world.

Delinquency, he said, results not so much from mental deficiency as from the repeated frustrations and humiliations the retarded child suffers in his pathetic attempts to keep up with his classmates and be like them.

Institutions, special schools and classes and psychological tests are just a means, not a solution, to the problem of retarded children, Dr. Seymour B. Sarason of Yale University declared at the conference.

Too often these "create the false impression that we are adequately handling the problems of mental retardation in children when all we are actually doing is putting up with them."

What is needed, he declared, is basic research which at present "is quite conspicuous by its absence."

Science News Letter, May 31, 1952

MAMMALOGY

Study of Lemmings Now Under Way at Smithsonian

➤ LEMMINGS, the curious rodents that periodically march to the sea to die in great numbers, are now being studied by the Smithsonian Institution.

Nucleus of the study is a collection, probably the most complete in the world, obtained in northern Canada and Greenland by Dr. Charles O. Handley, Jr., of the U. S. National Museum staff.

These short-tailed mouselike rodents inhabit the Arctic tundras of northern America, Europe, and Asia, and may be separated into two main types, Dr. Handley states.

The varying lemming is the only rodent known to change the color of its coat. It is brown or gray in summer and pure white in winter. The brown lemming stays brown all year around.

Scandinavian lemmings, after their population has reached a certain maximum, may start mass migrations. Rivers and towns do not stop them in their relentless march and they may eventually reach the ocean, where they are drowned by hundreds of thousands. These migrations appear to be due to hunger.

Like their Scandinavian counterparts, the American lemmings undergo great variations in numbers. Over a period of about four seasons they increase until there are literally billions of them that overrun the northern tundra. Then, in a single season, the majority of them die. Their bodies litter the ground and the banks of streams and ponds.

The reason for this apparently automatic check on population is unknown. It certainly is not starvation and is probably some disease or form of parasitism that appears only with over-population.

Science News Letter, May 31, 1952

PUBLIC HEALTH

Clean, Dry Dishes For Better Health

➤ WHETHER YOU wipe your dishes dry or let them drain dry may be settled to suit your own convenience.

But for health protection, two points are important: 1. If you wipe them dry, be sure to use clean towels. 2. Be sure the dishes are dry before you put them away. If stored while moist, the few germs that may still be on them after washing may live and multiply quickly.

Hand dishwashing is a drudgery to most people. Maybe the person doing it will find it less bothersome if she—or he—remembers that by doing this job right, she is helping to protect the family's health. Germs of many diseases can spread through dishes and eating utensils unless properly washed.

The right way to wash dishes has been described in a report by John Andrews, Sanitary Engineer of the U. S. Public Health Service. Dishes should first be scraped well to remove all food particles and preferably should be rinsed with water before the real washing is started. For hand dishwashing, Mr. Andrews advises a two- or three-compartment sink that is big enough and has adequate drainboards.

The wash water should be heated to 110 to 120 degrees Fahrenheit, which is about as hot as the hands can stand. It should contain a sufficient amount of soap, soap powder, washing powder or whatever cleansing agent is used. In addition, the dishwasher must use plenty of "elbow grease." If there are a lot of dishes to wash, the water will cool off during the process and the soap or other cleansing agent will get weaker. So the dishwasher must add more soap from time to time, keep the water hot and change it before it gets too dirty.

To sterilize dishes at home, stack them after washing in baskets with long handles and immerse for two minutes in water at least as hot as 170 degrees Fahrenheit.

Science News Letter, May 31, 1952

IN SCIENCE

MEDICINE

Amputees' Phantom Limb Works Electrical Arm

➤ PHANTOM LIMBS are now being made to work for instead of against the man or woman who has lost an arm.

A phantom limb is the feeling that the arm or leg is still there. In the past it has been a serious problem for both the amputee and his doctor. Medicines and even psychiatric treatment have been tried, usually with little success, to rid the amputee of this bothersome, sometimes painful limb.

Now the sensations are being used to work an electrical arm under development in Germany, Dr. Henry H. Kessler of Newark, N. J., reported to the meeting of the International College of Surgeons in Madrid, Spain.

Amputees have reported satisfaction with it and it "may prove to be an important step forward in the continuing search for an arm adequate to meet the needs of upper extremity amputees," Dr. Kessler said.

An electrical arm that operates on signals from pneumatic impulses from an insole in the shoes has been developed in the United States by the International Business Machines Corporation, Dr. Kessler said.

This electrical arm has been worn on trial since 1949 by amputee consultants. It is not yet available to other amputees.

The electrical section gives motive power to flex and extend the elbow and wrist, to rotate the hand and to close and open the fingers and thumb of the artificial arm and hand. A small but powerful motor in the forearm shell picks up the pneumatic impulses from the shoe insole. The hand of the electrical arm looks natural as well as being useful. The entire arm, however, is still in the experimental stage.

Science News Letter, May 31, 1952

TECHNOLOGY

Thickness Measured By Atomic Gauge

➤ AN ATOMIC thickness gauge that uses strontium 90, a beta-ray emitting waste of uranium fission, is being employed by rubber, plastics and paper producers to save millions of dollars annually, George B. Foster of the Industrial Nucleonics Corporation, Columbus, Ohio, reported to chemists in Cincinnati.

Installed along the production line, the device charts irregularities in the thickness of the product, permitting rapid adjustment of the machines.

Science News Letter, May 31, 1952

ENCE FIELDS

TECHNOLOGY

Milk Tank Trucks More Accurate Than Cans

➤ GIANT MILK-HOLDING vats in California dairies are stealing some of the spotlight away from the familiar 10-gallon milk cans. And creameries, which often pay for more milk than they get, apparently are not sorry.

H. J. McDade, sealer of weights and measures at San Diego, Calif., reported to the National Conference on Weights and Measures in Washington that the tanks will deliver milk to creamery pick-up trucks with an error of only two gallons in a thousand.

The 10-gallon milk cans, because of dents and frothy milk inside, often shortchange California creameries out of 12.5 gallons of milk in a thousand, he said.

Tank sizes of 300 to 3,000 gallons now are in use. Some that are even larger have been reported. The tanks can be refrigerated, but the well-insulated unrefrigerated kind will hold a quantity of milk 10 hours with a maximum temperature change of only two degrees Fahrenheit.

Science News Letter, May 31, 1952

PUBLIC SAFETY

Safe Clothes Recommended For Wear Around the House

➤ THE RECENT tragedies of "torch sweater" burns of people highlight advice that home economists have been giving housewives for many years.

This advice is that fluffy or fuzzy garments are not suitable for kitchen wear or for wear near any flame or strong heat. Clothes with long, loose sleeves, scarfs, ties or trimmings may be dangerous around stoves, hearths and bonfires.

Besides the danger of fire catching the sleeve, scarf or tie, there is danger that these loose parts of the costume may catch on a door handle or other object and cause a fall or one of those near-falls that wrench an arm or back.

As to fabrics, U. S. Department of Agriculture clothing specialists recommend smooth, closely woven fabric for women's work clothes for both convenience and safety. Fuzzy fabric, especially knitted fabric with brushed-up nap, has air spaces around the lightweight fibers which help keep fire alive, once it catches.

Most people know that fluff burns more readily than a solid mass, but many don't apply this knowledge to the clothes they wear for cooking, burning trash or on other occasions when there may be a fire hazard.

However, different fabrics burn very differently. Wool smolders but rarely flames, tends to curl up and choke out fire. A brushed wool sweater that accidentally comes against a hot stove, for example, may have the nap badly singed but probably will not burn down through the foundation.

In contrast, untreated rayon or cotton blazes when it burns, will continue burning if not put out, and is even more of a fire hazard with a fluffy nap. This is why so much research has been done on flameproof and fire-retardant treatments for these fabrics. Acetate fabrics also blaze, but then the burned edges pucker and curl as they melt to a hard, brittle mass. Nylon melts rather than flames, but, in melting, forms very hot glassy beads that can burn skin on contact with them.

Science News Letter, May 31, 1952

PUBLIC HEALTH

Follow Old Rule for Cooking Pork Thoroughly

➤ MANY FAMILIES are eating more pork than usual for economic reasons. Whether you cook it at home or eat it at a restaurant, remember the old rule that pork should be cooked until it is white and dry.

The white, dry meat has been thoroughly cooked and thorough cooking of pork is important for avoiding the danger of getting trichinosis. The same rule applies to pork products, from cocktail sausages and hot dogs to such more unusual varieties as mettwurst, which has been reported responsible for trichinosis in more than a score of cases.

Trichinosis is caused by the trichina worm. The larval form of these worms invade the muscles and become encysted there. During the first few days after pork containing encysted larvae has been eaten, the larvae leave the cysts and invade the lining of the intestines. The patient at this stage of the sickness may have symptoms of food poisoning, sometimes with a rash.

The next generation of worm larvae invade the muscles, causing excruciatingly painful muscular rheumatism. This may last for five to six weeks. The muscles used in breathing, speaking, chewing and swallowing may be particularly affected, and there may be swelling around the eyes, nose and temples, and high fever. The disease may be fatal.

The larvae can be killed either by heat or by freezing at 5 degrees Fahrenheit for 20 days. Not all pork and not all sausage and other pork products contain trichina worms. However, unless you know the pork or pork products are certified by state, city or federal authorities as safe for consumption, you should protect yourself by cooking them thoroughly. The rule for this is to cook so that all parts of the meat reach a temperature of at least 150 degrees Fahrenheit.

Science News Letter, May 31, 1952

MEDICINE

Drugs and Diet For Mucous Colitis

➤ A GOOD many people who suffer pain in the abdomen, or belly, and who are always conscious of their abdomens are suffering from mucous colitis.

The word colitis means inflammation of the colon, or large bowel. This part of the intestinal tract is about five feet long in a grown person and is divided into the ascending, the transverse and the descending sections. Its functions are to handle the indigestible material that is left after digestion and to take up water and sugar.

One type of colitis is mucous colitis. This, according to the Educational Committee of the Illinois State Medical Society, is caused by the spasm and contraction of muscles. There is usually sharp, intermittent pain, and the condition seems more noticeable after meals.

Mucous colitis is common in persons who experience strong emotional crises of fear, worry, fright, hate, confusion or frustration in business or social affairs. It is generally recognized that the digestive tract is affected by these emotional upsets, illustrative of the community relationship between mind and body.

Such common complaints as "butterflies in my stomach," "quivering" and "nervous stomach" seem to precipitate the final contractions or spasms which produce severe pain. The person with mucous colitis localizes his pain almost anywhere in the abdomen, but usually in the descending colon, just above the left hip and towards the middle of the body. Hyperacidity, heartburn and excess gas are other symptoms. Constipation is common and the stools reveal mucus or mucous shreds.

The patient with mucous colitis should be under the care of a physician. A bland or mild diet is often a helpful part of the treatment, with care taken to avoid roughage that might cause obstruction or irritation in the colon.

In patients with true mucous colitis, special drugs can alleviate the intermittent pain, which may persist for hours.

Science News Letter, May 31, 1952

CHEMISTRY

Low Pressures Prevent Corrosion from Chemicals

➤ WHEN LIQUIDS are concentrated at low pressures and temperatures, their corrosion rate on the still often is reduced materially, E. J. Kelly of the Carrier Corporation, Los Angeles, reported to the American Institute of Chemical Engineers meeting in French Lick, Ind.

By using low pressures, water can be driven from the liquid at lower temperatures. Since many chemicals are less active when cold, corrosion and in many cases scale-formation can be cut, he said.

Science News Letter, May 31, 1952

ASTRONOMY

Mars Still Prominent

During June the red planet is brighter than any other object in the evening sky. Saturn also visible near Spica in the constellation of Virgo, the virgin.

By JAMES STOKLEY

➤ ALTHOUGH MARS was closest to earth in May and is now receding, the red planet is still conspicuous in the southern evening sky. It is, in fact, brighter than any other star or planet now visible in the evening.

On the accompanying maps, which depict the sky at about 10:00 p. m. at the beginning of June, or an hour earlier in the middle (add one hour if you are on daylight time), the position of this planet is shown. It is in the constellation of Virgo, the Virgin, just east of the bright star Spica, which it exceeds in brilliance more than six times.

One other planet is now visible in the evening and, as it happens, in the same constellation. This is Saturn, to the west of Spica, which it surpasses only slightly in brightness.

The brightest star to be seen at this time of year is Vega which is high in the east, in Lyra, the lyre. Below this group is the swan, Cygnus, in which appears the northern cross with Deneb as its brightest star. To the right of Cygnus is Aquila, the eagle, in which Altair shines.

Atmosphere Dims Stars' Light

Though both Deneb and Altair are of the first magnitude in brightness, both are so low, as shown on the maps, that their light is appreciably dimmed by the greater distance it has to travel through the earth's atmosphere. Hence both are represented by the symbol for a star of the second magnitude. Later at night, as they rise higher, they will be seen in full brilliance.

Capella, in Auriga, the charioteer, shown just above the horizon in the northwest, is dimmed even more and is indicated here as of the third magnitude. Actually it is the second brightest of the stars that are now visible. As with Pollux in Gemini, the twins, just to the left, this is the last appearance of a winter star.

Arcturus, in the constellation of Bootes, the herdsman, which is high in the south above Virgo, is of the same magnitude as Capella, 0.2, so by comparing these stars the effect of atmospheric absorption is well shown.

Incidentally, a good way to locate Arcturus is to look first in the north for the big dipper, in Ursa Major, the great bear. As is well known, the two stars Dubhe and Merak at the bowl of the dipper are the pointers which show the direction of Polaris, the pole star, to the right. But if you follow the curve of the dipper's handle, ending with Alkaid toward the south, the first bright star you come to is Arcturus.

Another first magnitude star is Antares, in Scorpius, the scorpion, low in the south. The name of this star means "rival of Mars," doubtless applied because of their similar color. With Mars now only a short distance away, one can easily compare them.

It will not be possible to see Mercury and Venus at all in June. The former is at superior conjunction with the sun (i. e., directly behind it) on June 8, and the latter reaches a similar position on the 24th. Jupiter, which was behind the sun in April, is now well to the west of the sun, so it rises more than an hour before sunrise. It can be seen shining even more brightly than Mars, in the eastern sky at dawn.

Summer Begins Officially

With the coming of June, the official beginning of summer is close at hand. This event comes on Saturday, June 21, at 6:13 a. m., EST. At that moment, called the summer solstice, the sun reaches the northernmost portion of its annual path through the sky. Actually, of course, this movement of the sun is only apparent. As the earth revolves around it, it stands against an ever-changing background of distant stars.

The axis on which the earth rotates is not exactly at right angles to the plane in which it revolves around the sun, but is tilted from the vertical about 23½ degrees, which is why terrestrial globes are usually constructed with such a slant.

This slant is the reason for the seasons, for if the axis really were perpendicular to the plane of our orbit, all parts of the globe would have the same season continually. On the other hand, if the inclination were much greater than it is, the seasonal changes would be more extreme.

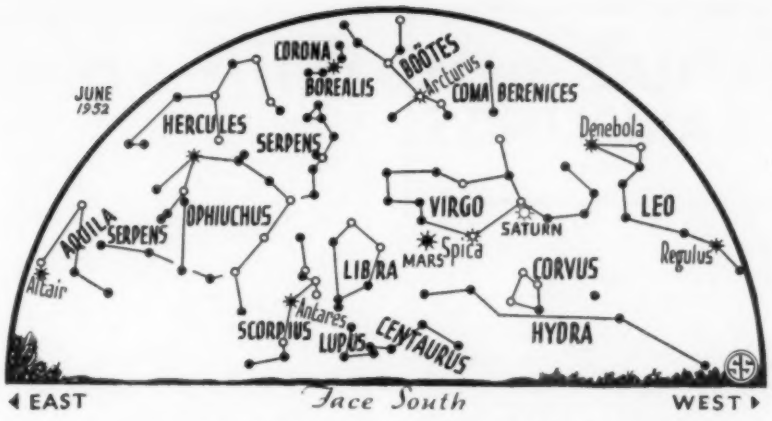
At this time of year, the north pole leans over toward the sun, which thus rises highest for places in the northern hemisphere. Six months from now, just before Christmas, will come the winter solstice. The north pole will lean farthest away from the sun, which will then be far to the south. But at that time the south pole will be leaning sunwards, so for people in the southern hemisphere the sun will rise high in the sky, making our winter solstice the beginning of their summer. Conversely, on June 21, when summer begins for us, winter begins in southern countries.

Short Sky Path in December

In December when the sun is far south, it rises south of the east point of the horizon and sets well to the south of the west point. Even its noon-day height is lower than at other times of year, so its path across the sky is a short one.

At 40 degrees latitude on the day of the winter solstice, the sun is above the horizon for only 9 hours 20 minutes. In contrast, on June 21, the time from sunrise in the northeast to sunset in the northwest will be 15 hours.

This is part of the reason why we are now coming to the warmest weather of the year, for with the sun's rays shining on us so much longer, we are bound to get hotter. But even more important is the greater height of the sun. If it were directly overhead, a beam of sunlight a yard square would cover exactly one square yard of the ground. At no point in the United States does it come exactly to the zenith but, at 40 north latitude, it comes within 16½ degrees of it, so the solar radiation is still quite concentrated.



☼ ✸ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Compare what happens on Dec. 21. Then the sun, at its highest for 40 north latitude, is 63½ degrees from the zenith; that is, it is only 26½ degrees from the horizon. Our yard-square beam of sunlight is then spread over about 2¼ square yards, so its heating effect is less than half as great. This, combined with the shorter duration of sunshine, accounts for the small amount of heat the northern hemisphere gets in winter.

If it were just a matter of the heat coming from the sun, however, we would have warmest weather at the summer solstice, and coldest at the one of winter. But, for some weeks after the summer solstice, the ground gets more heat during the day than it can give up during the night.

Each day is a little warmer than the day before, until the last half of July, when maximum temperatures may be reached. A similar effect, in reverse, accounts for the fact that the coldest weather comes not at Dec. 21, but in January. Not until then does the earth begin to gain during the day as much heat as it lost during the preceding night, and thus permit general temperatures to increase.

Celestial Timetable for June

June	EST	
3	4:14 a. m.	Moon passes Saturn
4	8:22 p. m.	Moon passes Mars
8	12:07 a. m.	Full moon
10	2:00 a. m.	Moon nearest, distance 225,200 miles
14	3:28 p. m.	Moon in last quarter
18	8:46 a. m.	Moon passes Jupiter
21	6:13 a. m.	Sun farthest north, summer commences in northern hemisphere
22	3:45 a. m.	New moon
25	6:00 p. m.	Moon farthest, distance 252,100 miles
30	8:11 a. m.	Moon in first quarter
	1:12 p. m.	Moon passes Saturn

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, May 31, 1952

MEDICINE

Aid Brucellosis Treatment

➤ TREATMENT OF brucellosis is from two to ten times as effective when patients are given desensitizing and immunizing shots along with an antibiotic drug such as chloromycetin, Drs. Alberto P. Leon, C. Cano and M. E. Vergara of the Institute of Public Health and Tropical Diseases, Mexico City, find.

Brucellosis, also called undulant fever and Malta fever, is a long drawn-out, weakening sickness with the fever coming and going. It is acquired chiefly by drinking raw milk from cows that have the disease.

Chloromycetin and other antibiotics such as streptomycin, aureomycin and terramycin give prompt but not lasting results in treatment of patients with brucellosis. Dr. Leon and associates point out that relapses come because the body has not built up resistance to the germs during the time they are being held at bay by the antibiotic drug. Their treatment is designed to increase this resistance.

Brucellosis germs cause an allergic reaction as well as infection, so immunizing shots must be given in small, progressively increasing doses to desensitize the patient to the material so that enough can be given to produce immunity.

Dr. Leon and associates have now treated almost 500 patients by this method. In 79 reported on in detail in the journal SCIENCE (May 23), they state that fever disappeared in an average of three days and other symptoms in "some weeks."

There were only 6.3% relapses over a period of 11.4 months, compared to relapses of 12% to 66% reported by other doctors who used chloromycetin without the sensitizing and immunizing shots used by Dr. Leon and his co-workers.

Science News Letter, May 31, 1952

MEDICINE

Men Need to Be Cancer Alerted

➤ MANY MEN have the wrong notion that cancer is a woman's disease. Many others refuse to think about cancer because they have the idea, again a wrong one, that if they get cancer "they're done for."

Actually, as many men die of cancer as women. But very many of them can be saved, just as is the case with women. Most of the cancers that affect men are more difficult to detect than those that affect women. Consequently, if a man wants to be saved from cancer death, for his own sake and his family's, he should be particularly alert to cancer. And remember that pain is not an early symptom of cancer, so don't wait for pain to send you to a doctor to see whether you have cancer.

Things a man can do to protect himself, as given by the American Cancer Society, are the following:

First: Have a thorough checkup (including a rectal examination) by your family physician once a year. This is especially important if you are in the danger period—from age 40 on. Pick a regular time, such as the week before your birthday.

Second: Learn the seven danger signals which may mean cancer—

1. Any sore that does not heal.
2. A lump or thickening in the breast or elsewhere.
3. Unusual bleeding or discharge.
4. Any change in a wart or mole.
5. Persistent indigestion or difficulty in swallowing.
6. Persistent hoarseness or cough.
7. Any change in normal bowel habits.

Third: Don't take home remedies for persistent indigestion instead of seeing your doctor. This symptom (especially after age 40) is always serious and you should immediately learn the cause. A persistent cough or hoarseness should always be investigated. Give your teeth and mouth good care. Don't smoke too much.

Science News Letter, May 31, 1952

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ENGINEERING

Navy Explores New Engine For Trucks, Ships, Subs

➤ A REVOLUTIONARY engine for small trucks may result from research work currently being conducted by the U. S. Navy on free-piston engines.

The Navy, of course, hopes to apply the power plant eventually to its small surface ships and to its submarines. During World War II, the Germans successfully used it to drive auxiliary equipment on submarines.

The machine is sort of a diesel engine with a built-in air compressor. It differs from conventional engines, however, in that it has two pistons enclosed in opposite ends of a cylinder. Fuel is injected in the middle of the cylinder and the following explosion "knocks" the pistons into their respective cylinder ends.

Compressed air in the cylinder ends bounces the pistons back to the starting point as the spent fuel is expelled. Air compressed in a different part of the same cylinder is delivered to the load. Prof. A. L. London, mechanical engineer at Stanford University, is supervising the work being conducted there under a Navy contract on the heat aspects of the machine.

Science News Letter, May 31, 1952

CHEMISTRY

Germ Warfare Charges "Ridiculous," General Says

➤ "THE COMMUNIST propaganda about our use of BW (germ warfare) in Korea is ridiculous," Maj. Gen. E. F. Bullene, Chief Chemical Officer, Department of the Army, said at the meeting of the Armed Forces Chemical Association in Chicago.

Poison gas, however, may be used against us in "the next war" and, Gen. Bullene strongly hinted, we might use it ourselves.

Reasons for use of poison gas in war are that it is relatively cheap and knocks out troops and personnel without destroying material, factories, buildings and the like.

In World War II a 100-pound general purpose, high explosive bomb cost almost a third more than a 100-pound mustard gas bomb. The victories of World War II in which whole cities were destroyed put a heavy strain on us as well as our former enemies in terms of postwar economic reconstruction. Any nation that starts another war is going to consider this factor.

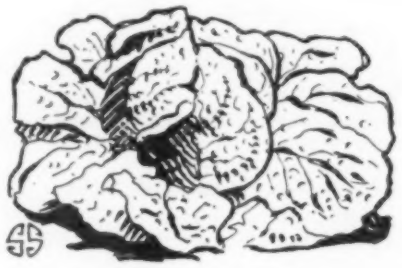
We must therefore be prepared to have poison gas used against both our troops and our civilian industrial workers, Gen. Bullene declared.

The size and capabilities of our chemical industry and the potential of poison gas in warfare, Gen. Bullene said, "make up one of our bulwarks to prevent war and, if a conflict unfortunately does come, is our principal means of insuring victory."

Science News Letter, May 31, 1952

BOTANY

NATURE RAMBLINGS



From Many Lands

➤ ALL QUARTERS of the globe meet at the crossroads of our garden paths. Contributions from the Old World predominate, for the majority of us are, after all, transplanted Europeans, but the Americas make substantial offerings as well.

The triad that every home gardener sets out, no matter how tiny his plot—lettuce, radishes and onions—all seem to have started somewhere near the eastern end of the Mediterranean.

At any rate, they were there at the dawn of history, for we find them mentioned in ancient Egyptian inscriptions. There is one document about the earliest strike on record: laborers in some pharaoh's monumental project refused to go back to work until they got more radishes and onions to eat with their bread.

Cabbage is European, from the chalk cliffs of England and across the North Sea in Denmark and the Low Countries. Wild cabbage still grows in these places: though you would hardly recognize the little, open rosette of leaves as ancestral to the tight round heads we harvest—or hope to, anyway. The cabbage-head is really an exaggerated central leaf-bud.

Carrots and beets are of Eurasian origin also. Although carrots have run wild in this country as a weed, called Queen-Anne's-lace, beets have shown no tendency to do so. Peas, too, are from the Old World, as are cucumbers and cantaloupes. Watermelons are African in origin.

New World vegetables include potatoes, tomatoes, green peppers, pumpkins, most squashes, and all beans except the little-used Windsor or broad bean and the table soybean which is now coming into real popularity. Sweet corn, too, is American, though the Indians made little use of it before arrival of white men.

Some of these American vegetables reached our gardens by round-about paths. Potatoes, for example, were carried to continental Europe from South America, thence to England and Ireland, from there to Bermuda, and finally to the colony of Virginia.

You may smoke while you cultivate your garden. You may also use a nicotine spray to combat certain insect pests. In either, you are making use of another American plant: tobacco was used by most of the Indians of both continents when Columbus landed, and was not known before then in other parts of the world.

Science News Letter, May 31, 1952

MEDICINE

Babies Get Ulcers, Too

➤ YOUNG CHILDREN and even babies get stomach ulcers. Nervous tension, worry and anxiety can cause them just as in grown-ups.

Symptoms are the same as in grown-ups, too. The only difference is that the ulcer pain may hit children without relation to meals, while in grown-ups this pain characteristically comes two or three hours after a meal.

Parents and pediatricians (baby doctors) should therefore realize that not all "tummy aches" are just digestive upsets, Drs. W. Warwick Cardozo, R. Kelly Brown and T. Wilkins Davis of Howard University School of Medicine and Freedmen's Hospital, Washington, warned at the meeting of the American Academy of Pediatrics in Washington.

The child whose parents are over-anxious for him to be a star pupil at school, to excel in dancing or music and who pressure him all the time is the one likely to become so tense that he develops ulcers.

In some cases these child ulcer victims are only children of older parents. In their pleasure at having a baby the parents may be too watchful, jumping up several times at night to listen for the new baby's breathing, waking him several times to change his diapers, and in all of this creating an anxious, tense atmosphere.

Treatment for small ulcer victims as given by the Washington doctors is much the same as for grown-ups: an anti-spasmodic medicine to quiet the digestive tract and stomach and a modified Sippy diet. A sedative is also given for the first two weeks of treatment.

Science News Letter, May 31, 1952

Ethylene gas added to *citrus* storage atmospheres in small amounts causes the fruit to lose its green color and develop a natural mature color within a few days.

TECHNOLOGY

Gaudy Air Rescue Suit

➤ GAUDY YELLOW coveralls complete with built-in water wings now are being used by the U. S. Air Force to protect its pilots against exposure after airplane crack-ups.

Worn during flights, the suit has a sponge-rubber neck and water-tight zippers in front to keep water and icy winds from getting inside. Wrap-around rubber straps seal water out at the wrists.

If a pilot bails out of his plane while flying over water, trapped air in the suit keeps him afloat for about three minutes. That gives him time to blow up his water wings. The suit's bright yellow color is easily spotted against murky waters.

Rubber boots vulcanized to the suit-legs lend a sort of Frankenstein monster air to the outfit. But they permit the pilot to wear two pairs of heavy wool socks to protect his feet if he must bail out over land.

Developed at the Air Force Aero Medical Laboratory, Dayton, Ohio, the suit usually goes over woolen flying pants, a wool jacket and a miniature radio transmitter. It transforms large pilots into small giants, the Air Force says.

Outside the suit the pilot also wears a life preserver and a back-type parachute which has a built-in survival kit containing everything from food to a .22 caliber rifle.

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ANTI-EXPOSURE SUIT—Fliers of the U. S. Air Force's 117 Tactical Reconnaissance Wing wear this type of suit for transatlantic hops to increase their survival chances in case of bail-out.

MEDICINE

Drug Lengthens Lives

➤ SOME CHILDREN who formerly would have been doomed to death within a few months after contracting acute leukemia, cancer of the blood, now live happy, healthy normal lives for as long as two and one-half years.

They take a pill once a day of amethopterin. It is one of the few tasteless medicines known to physicians. With this anti-vitamin of the folic acid class, 30% to 50% of children with leukemia have responded to treatment, so that temporarily there are remissions of the disease.

Dr. Joseph H. Burchenal, head of the leukemia section at Sloan-Kettering Institute, New York, said that of 150 leukemia victims, young and old, before the treatment was discovered, 138 were dead within nine months, 10 more died before the end of the year. The two remaining victims were dead in a year and a half. Of 154 young and old patients who were treated with amethopterin, 61 are still alive at the end of nine months, 46 at the end of a year, 12 after one and a half years, and six at the end of two years. One or two children not in this series, said Dr. Burchenal, have lived as long as two and one-half years.

Children can live normally up to the last few weeks of the disease, Dr. Burchenal said. They come to the out-patient clinic once or twice a week for a general examination. However, they take their pills at home. Once every two weeks the doctors check the bone marrow to watch the count of leukemia cells.

This way they can catch a relapse about two weeks before it would be evident in the general health of the child. The pills are taken only during periods of relapse. Unfortunately, after eight, 10 or 12 relapses, leukemia cells become resistant to amethopterin. Then ACTH and cortisone are given. If this creates a remission, there is a slim chance that amethopterin would work for the next relapse. If not, sometimes two or three remissions may be achieved with ACTH and cortisone.

Dr. Burchenal reports that all the parents are grateful for this longer time with their children who they know are going to die. One father wrote that he got to know his son better during the last few years of his life than he might have if he had not realized he was going to die.

Science News Letter, May 31, 1952

PHYSIOLOGY

Crossed Eyes Can Be Cured But Early Treatment Best

➤ CROSSED EYES can be corrected. The earlier this is done, the better, so that the child does not lose part or all of his eyesight.

It is best to start treatment before the age of four, but older children and even grown-ups can have their eyes straightened. It may be too late to improve the eyesight, but at least the older child or grown-up can be saved from feeling ugly, different and unwanted.

"Don't assume, as many do, that a child will just outgrow crossed eyes. He won't," warns the National Society for the Prevention of Blindness. In a pamphlet published by the society it is explained that the brain of a cross-eyed child "receives two images. The youngster sees double because his crossed eyes view an object from widely different angles."

"The child is disturbed but often too young to explain his difficulty. He squints his eyes and tilts his head, unconsciously trying either to combine the two images into one, or simply to ignore one image altogether. But neither attempt succeeds. So he finally gives up trying to see with both eyes. He subconsciously eliminates the image in one eye, now sees only one image, and actually becomes accustomed to 'one-eyed' sight."

The pamphlet lists these four methods used by doctors to correct crossed eyes:

1. Glasses—if the youngster is near- or farsighted. In some few cases, glasses alone will do the job.

2. Placing a patch over the good eye. This forces the youngster to use the weak eye; with increased work, its vision will increase.

3. Exercises for the eye muscles (orthoptics). These do not take the place of surgery or glasses, but are a valuable help.

4. Surgery—which is not dangerous; its effect on the child is equivalent to a tonsil removal. One operation may be all that's needed, but it sometimes takes two or three before the eyes are exactly straight.

Science News Letter, May 31, 1952

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ATOMIC POWER: An Economic and Social Analysis—Walter Isard and Vincent Whitney—*Blakiston*, 235 p., illus., $4.75. Some of the concrete information necessary for solving the complex problem of international atomic control. Intended for scientists, administrators and interested laymen.

BACTERIA—K. A. Bisset and F. W. Moore—*Williams and Wilkins*, 123 p., illus., $4.00. A natural history of bacteria for students of microbiology and researchers in industry, medicine and biochemistry.

BASIC AERONAUTICS—Merrill E. Tower—*Aero*, 252 p., illus., $3.70. For use in high school or junior college classes or by laymen who want basic knowledge of aviation.

THE COMPLETE BOOK OF DRIED ARRANGEMENTS—Raye Miller Underwood—*Barrows*, 193 p., illus., $4.95. Methods for preserving flowers and foliages in sand, borax or glycerin, and using them in decorative arrangements. Includes sections on pressed-flower pictures and trays.

CONTROL FROM WITHIN: Techniques for the Treatment of the Aggressive Child—Fritz Redl and David Wineman—*Free Press*, 332 p., $4.50. The authors of "Children Who Hate" here tell in detail how such children can be helped, drawing on their experiences at Pioneer House.

EATING IS FUN—FOR OLDER PEOPLE, TOO—*American Dietetic Association*, 17 p., illus., paper, 50 cents. Ideas and menu patterns for pleasantly supplying the nutritive needs for older people, for use in homes for the aging or in family groups.

FLAMINGO HUNT—Paul A. Zahl—*Bobbs-Merrill*, 270 p., illus., $3.50. The story of a scientist's search in the waters of the Bahama Islands for the nesting grounds of flamingos.

HARDNESS AND FLEXIBILITY OF NATURAL AND SYNTHETIC RESIN VARNISHES—Robert L. Feller—*Mellon Institute*, 2 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Reprinted from *The Museum News*.

INDIANS OF THE ANDES: Aymaras and Quechuas—Harold Osborne—*Harvard University Press*, 266 p., illus., $4.50. The history and ecology of the highland peoples of the Central Andes, whose empire before the European conquest was the most extensive and advanced in the New World.

INTRODUCTORY GENERAL CHEMISTRY—John E. Cavelti—*Blakiston*, 423 p., illus., $4.50. For a terminal college course or for the chemistry major's first course, with an emphasis on readability which, the author hopes, may help overcome the "shrinking horror" with which otherwise well-educated people often approach science of any kind.

MEDICAL BIOGRAPHIES: The Ailments of Thirty-three Famous Persons—Philip Marshall Dale—*University of Oklahoma Press*, 259 p., illus., $4.00. Lives of the great from Buddha to Robert Louis Stevenson reexamined in the light of current medical knowledge; for the layman.

MISCELLANEOUS PHYSICAL AND CHEMICAL TECHNIQUES OF THE LOS ALAMOS PROJECT: Experimental Techniques—Alvin C. Graves and Darol K. Froman—*McGraw*, 323 p., illus., $4.00. Another in the National Nuclear Energy Series, describing apparatus and techniques used during the early atomic energy research, some of which are still applicable to present-day laboratory situations.

MODERN CHEMICAL PROCESSES: A Series of Articles Describing Chemical Manufacturing Plants. Volume II.—The Editors of *Industrial and Engineering Chemistry*—*Reinhold*, 299 p., illus., $5.00. Articles originally published in *Industrial and Engineering Chemistry* under the title, "Staff-Industry Collaborative Reports."

MY FIGHT TO CONQUER MULTIPLE SCLEROSIS—Hinton D. Jonez—*Messner*, 227 p., $3.50. The story of Dr. Jonez' work at the Multiple Sclerosis Clinic of St. Joseph Hospital in Tacoma, Washington, to apply current medical knowledge to the treatment of this crippling disease.

NEWS AND THESE UNITED STATES—Edith Merwin Bartow—*Funk & Wagnalls*, 292 p., illus., $5.00. The story of journalism in America, informally told and with the cheering conclusion that: "Towards better newspapers, better reporting, and better defense of its readers, the entire American press is steadily progressing."

SOIL PHYSICAL CONDITIONS AND PLANT GROWTH—Byron T. Shaw, Ed.—*Academic Press*, 491 p., illus., $8.80. To provide students and agriculturalists with a critical evaluation of present knowledge and to point out areas in which more data are needed.

STEEL INDUSTRY—Richard D. Hoak—*Mellon Institute*, 8 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Reprinted from *Industrial and Engineering Chemistry*.

SYSTEMATIC COLLEGE CHEMISTRY—Lytle Raymond Parks and Warren H. Steinbach—*Blakiston*, 692 p., illus., $5.50. A new text for the student who has had a high school course in physical science, whether or not he has previously studied chemistry.

TOTAL ECLIPSE OF THE SUN, JUNE 30, 1954—Nautical Almanac Office—*Govt. Printing Office* (Supplement to the American Ephemeris, 1954), 42 p., paper, 40 cents. Technical information for use along the path of the total phase in the United States, Canada, and Greenland. Maps are included.

U. S. FIGHTING PLANES 1952—Dale W. Cox—*Arco*, 64 p., illus., $2.00. Photographs and statistics of U. S. military aircraft.

WATER: A Study of Its Properties, Its Constitution, Its Circulation on the Earth, and Its Utilization by Man—Cyril S. Fox—*Philosophical Library*, 148 p., illus., $8.75. An outline of the science of water, in its academic and practical aspects, to "draw attention to the immense importance of the control and use of water." Written by an Englishman, the book gives close study to the land-reclamation schemes of the U. S.

WILD FLOWERS FOR YOUR GARDEN—Helen S. Hull—*Barrows*, 280 p., illus., $4.95. How to grow and use 50 most popular and dependable wild flowers.

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AERONAUTICS

Airliners With Turbo-Prop Being Built in England

➤ FAST 100-PASSENGER airliners with turbo-prop propulsion are under construction in England. They are for long-range routes and will have speeds considerably greater than conventional airliners but not as great as the turbo-jet transport which has just gone into regular service between London and South Africa.

The new planes will be known as Britannias. Twnety-five are now under construction, an official of the British Overseas Airways Corporation has reported. They are versions of the British giant Brabazon transport equipped with gas-turbine engines instead of conventional reciprocating power plants.

Turbo-prop propulsion uses an engine much like that employed in the turbo-jet engine for jet propulsion but all of the power generated is applied to a turbine shaft to produce rotation and drive ordinary rotating propellers. They will provide the new airliners with a speed approaching 400 miles an hour. At the same time there will be greater comfort for passengers because the airliners will fly at high altitudes above the atmospheric turbulence encountered near the earth and the vibrations in planes powered with reciprocating engines will be lacking.

Science News Letter, May 31, 1952

INVENTION

Wakeless Torpedo Finally Patented

➤ A WAKELESS torpedo for which patent application was filed back in 1936 has finally been granted a patent. Meanwhile, the inventor, Dr. Robert H. Canfield, Washington, has died. It is believed that granting of the patent was held up so long for security reasons. The patent number is 2,589,225.

The torpedo is adapted to burn a fuel mixture which will produce exhaust gases that will be absorbed by the water. Hence, bubbles which produce the telltale wake will not be formed.

Formerly, the inventor claimed, torpedoes were driven by the product of a combustion of fuel with air. Nitrogen was discharged, producing the bubbles. Dr. Canfield discovered that when a fuel composed of compounds of hydrogen and carbon, or of hydrogen, carbon and oxygen is burned in nearly pure oxygen, the products are completely absorbed in water.

Science News Letter, May 31, 1952

PHYSICS

Probe Upper Atmosphere

➤ EXPLORATION of the strange region 100 miles or so above the earth using sound waves pitched too low for the human ear to hear has been suggested in London.

Rockets have penetrated to this great height, and either brought or radioed back information about atmospheric conditions far above the earth's surface. But they roar skyward infrequently. Radio waves can also be used to explore this mysterious region.

Experiments with abnormal sound would, however, give us "invaluable information on the structure and properties of the higher atmosphere," Dr. J. Veldkamp of the Royal Netherlands Meteorological Institute in De Bilt states.

In somewhat the same way as seismologists learn much about the structure of the earth's interior by the nature of the waves sent out by earthquakes, so physicists can tell some of the conditions of the atmosphere by the changes in very low-pitched sound waves returned to earth by the ionosphere. Such sound waves can be heard only at abnormal distances and, since they are in part pitched too low for the human ear to hear, special instruments must be used to detect them.

These very low-pitched sound waves have been known to travel as high as 100 miles before they are bounced back to the earth, and to return 500 to 600 miles from their starting point. Sound waves in the range of human hearing, however, are absorbed before they can be bounced back to earth.

By measuring accurately the travel time and the intensity of abnormal sound, physicists could gain much valuable information on the temperature and pressure in the ionosphere, Dr. Veldkamp states, particularly in regions which until now have been explored only by radio signals and an occasional rocket.

His proposal was made in the JOURNAL OF ATMOSPHERIC AND TERRESTRIAL PHYSICS.

Science News Letter, May 31, 1952

ELECTRONICS

TV for Half of Population

➤ NEARLY HALF of the total population of continental United States will be able in July of this year to follow by television the activities at the Chicago conventions at which Republicans and Democrats will nominate candidates for the presidency.

They will be able to do so by means of the approximately 17,000,000 television receivers now in use in America.

Elaborate plans for radio and television broadcasting have been made for these coming political conventions, RCA stockholders were told in New York by David Sarnoff, chairman of the RCA board. By election time in November, there will probably be 18,000,000 television sets in use in America. This is in addition to the 105,000,000 radio receivers in this country.

By convention time in 1956, the great majority of Americans will be able to watch convention events, it is predicted. By that time most of the total area of America will be within television reception areas. Many new television broadcasting stations will be erected in the near future now that the Federal Communications Commission has lifted the "freeze" of the past few years and given permission for the program to proceed.

Nation-wide networks of television broadcasting will become possible with the extension of coaxial cables now under way and of relay stations for transmitting television by air. The present coast-to-coast network utilizes such relays. Coaxial cable is primarily for telephone communication but can and is being used for television.

Americans will be able to sit in their homes and watch events as they take place in London and Paris within five years, it was predicted by Mr. Sarnoff. Respecting international television, there are technical, economic and political problems that must be solved before regular service can be established. But, he stated, "it is my present belief that international television as a regular service will be realized within the next five years."

Science News Letter, May 31, 1952

MEDICINE

Diet Control of Polio Ruled Out in Mouse Study

➤ HOPE OF controlling poliomyelitis or preventing the paralyzing effects of this disease by diet is ruled out, reports Dr. T. F. McNair Scott, director of research at Children's Hospital, Philadelphia, to the National Foundation for Infantile Paralysis in New York.

Studies of the effects of various diets on mice infected with the Lansing strain of human polio, made over the past 10 years at his institution, are the basis of Dr. Scott's statement.

Despite trials using simple and combined diet deficiencies, investigators came to the conclusion that in no way can an experimental animal be made absolutely resistant to poliomyelitis infection through dietary means.

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● RADIO

Saturday, June 7, 1952, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Thurlow C. Nelson, professor of zoology, Rutgers University, New Brunswick, N. J., discusses "The Story of Oysters."

OCEANOGRAPHY

Two-Ship Scientific Fleet Explores Vast Pacific Area

➤ THE HORIZON, research vessel of the University of California's Scripps Institution of Oceanography, is now starting to explore a 4,000,000-square-mile area of the eastern equatorial Pacific that is an almost complete blank on most navigational and research charts.

The three-months cruise will take the ship as far south as Callao, Peru, with stops to be made also at Acapulco, Mexico, Puntarenas, Costa Rica, and Guayaquil, Ecuador.

A companion vessel, the EPCE (R) 857 of the U. S. Navy's Electronics Laboratory, left San Diego, Calif., early in the month of May. The two vessels will join in mid-ocean.

The project, which has been dubbed "Shellback Expedition" because it crosses the equator, is jointly sponsored by the University of California's Scripps Institution of Oceanography, the Inter-American Tropical Tuna Commission, the U. S. Fish and Wildlife Service and the Navy's Electronics Laboratory.

The two-ship scientific fleet will study currents, weather, chemical composition of the sea, undersea geology, sound transmission through water and marine life in this vast ocean area that has previously been almost unexplored.

The findings will have many practical results and affect many Americans—ranging all the way from the housewife who makes a tuna salad, to navigators aboard vessels in Pacific shipping lanes, to shipwrecked mariners or passengers of crashed airplanes.

Science News Letter, May 31, 1952

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PAINT-TREATING FLUID, when mixed with paint remaining in the can, prevents skin from forming and keeps the left-over paint fresh for long periods of time. Since the fluid does not discolor or harm the paint, the remaining portion can be used for touch-up jobs.

Science News Letter, May 31, 1952

DICTATION SYSTEM permits several persons to dictate by telephone to one machine by remote control. Control buttons allow the dictator to play back part or all of his dictation, to indicate corrections and to signal his secretary. Lights on "party line" phones glow when no one is using the system.

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ISOLATION BOXES made of phenolic plastic permit television sets in apartment houses, hotels and in communities out of the normal television service to operate from master antennas with negligible line loading. The boxes require no power source, and can be obtained for either 300-ohm or 72-ohm cable.

Science News Letter, May 31, 1952

UNBREAKABLE SIGNAL light for control panels is only ⅞ of an inch long and fits into a molded nylon socket of about ⅜ of an inch in diameter. Easily replaced from the front of the panel, the bulb operates satisfactorily on power sources varying from three to six volts.

Science News Letter, May 31, 1952

MICRO-MOTION MOVIES taken with simple equipment break each minute into 1,000 pictures and enable design engineers to improve production line efficiency. One such study is shown in the photograph. After studying the 16 mm. record of machine operators at work, engineers have redesigned the machinery and, in one case, increased output by 400%.

Science News Letter, May 31, 1952

FORMED STEEL plates strengthen boat oars at the oar-lock pin and prevent the pin from cutting into the wood. Riveted to the oars by the user, the rust-resisting plates should last the lifetime of the boat.

Science News Letter, May 31, 1952

SAUCE WARMER, a ceramic pot heated by a long-burning candle, will keep butter, hollandaise, Bernaise and other kinds of butter sauces warm during an entire meal. Available in two colors, the pot has a two-ounce capacity and is held over the candle flame by a stainless metal stand.

Science News Letter, May 31, 1952

SURFACE TENSION meter consisting of two 5" x 7" glass plates clamped together with removable clips yields results accurate to within 5% for any liquid that wets glass. Easy to operate, the instrument is handy for making on-the-spot checks.

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Do You Know?

The present world *population* is about 2.3 billion; at the current rate of growth, it will double in 85 years.

A five-tube radar amplifier no larger than a cigarette package is the principal steering factor in one modern guided *missile*.

The only liquid that has more chemical uses than sulfuric acid is *water*, just plain water.

An *octopus* can make half of its body quite dark and the other half light; it is capable of more striking color changes than almost any other animal in the world.

The cost of *electronic* equipment alone in some of the new jet bombers is more than the entire cost of two World War II heavy bombers.

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